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ABSTRACT

Regulating closed-captioned videotape prompt rates as a technological approach to improve reading comprehension/retention skills in "at risk" elementary school students is addressed. It is a within factor experimental design which examines retention of learning from closed-caption videotape with regulated prompt rates. Two groups comprised of 158 fourth, fifth, and sixth grade reading deficient students participated in a pilot study (18 students) and experimental study (140 students). Students were randomly assigned to either an average-paced closed-caption video, a slow-paced closed-captioned video, or printed text with no video, serving as a control measure. Results indicate significantly more learning occurs for those students using captioned video compared to those having traditional print materials. Additionally, students assigned to the slow-paced prompt rate retained significantly more information than those having the average-paced captioning. Results suggest that educators can better help reading deficient students by choosing captioned video curriculum rather than traditional print materials. Results also suggest that video producers should take into consideration the prompt rate of their captioned video materials and implement caption prompt rates that are appropriately paced for use in inclusive classroom environments. Data is illustrated in three tables and three figures. (Contains 21 references.) (Author)

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ED 383 326

Title:

Closed-Captioned Prompt Rates: Their Influence on Reading Outcomes

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Abstract

The high school graduation rate will increase to 90%, and every adult American will be literate and possess the knowledge and skills necessary to compete in a global economy are two of six national education goals advocated in "America 2000." At this time the majority of high school drop-outs are considered seriously deficient in reading, English, mathematics, and other functional skills. Consequently, our nation's competitiveness in the global economy is weakened and the burden of social welfare programs has been increasing. The earlier reading improvements can be accomplished, the better the chance to increase high school graduation rates.

This study addresses regulating closed-captioned videotape prompt rates as a technological approach to improve reading comprehension/retention skills in "at risk" elementary school students. It is a within factor experimental design which examines retention of learning from closed-captioned videotape with regulated prompt rates. Two groups comprised of 158 fourth, fifth, and sixth grade reading deficient students (i.e., Chapter 1 and mildly disabled) participated in a Pilot Study (18 students) and Experimental Study (140 students). Students were randomly assigned to either an Average-Paced Closed-Captioned Video, a Slow-Paced Closed-Captioned Video, or printed text (no video), which served as a control measure.

Results indicate significantly more learning occurs for those students using captioned video compared to those having traditional print materials. Additionally, students assigned to the Slow-Paced Prompt Rate retained significantly more information than those having the Average-Paced captioned video.

These results suggest educators can better help their reading deficient students by choosing captioned video curriculum other than traditional print materials. Results also suggest that video producers should take into consideration the prompt rate of their captioned video materials and implement captioned prompt rates that are appropriately paced for use in inclusive classroom environments.

Introduction

Title 1/Chapter 1 of the Elementary and Secondary Education Act (ESEA), enacted in 1965, and PL 94-142, enacted in 1975, have been the driving forces providing extra instruction in compensatory programs in reading, writing, and mathematics to millions of disadvantaged, "at risk" children, and mildly disabled children. For both programs, there is little consistency within and between states as to method of instruction, materials, and mode of evaluation (LeTendre, 1991; Johnson, 1987). As early as 1979 Drum and Calfee reported reading compensatory programs resembled "regular" reading instruction and suggested the programs only added **amount** of instruction without changing the **manner** of instruction. LeTendre (1991) comments that most Chapter 1 reading programs still rely on traditional practices (i.e., ditto sheets, questions at the end of chapters, etc.).

Despite these efforts, compensatory reading programs are not highly successful in bringing students to reading levels of their more advantaged peers. In an extensive U. S. Department of Education study, the report concluded that "students receiving Chapter 1 services experience larger increases in their standardized achievement test scores than comparable students who do not. However, their gains do not move them substantially toward the achievement levels of more advantaged students" (cited in Fagan & Heid, 1991). The level of reading improvement for mildly disabled students is equally dismal (Levine, 1987). They never catch-up with their nondisabled peers. Chapter 1 and reading programs provided for mildly disabled students are closely related in that both programs are presently under close scrutiny for accountability for student performance. It is estimated the majority of students who drop out of school have severe reading deficits, despite receiving Chapter 1 or services in reading for learning disabilities (LeTendre, 1991; Johnson, 1987).

The reauthorization of Chapter 1 by the Hawkins-Stafford School Improvement Amendments of 1988 (U.S. House of Representatives Committee on Education and Labor) mandates accountability for reading improvements; the new "transition" amendment to Individuals with Disabilities Act (IDEA) essentially raises the same issues (Sherman & Sherman, 1989). Latest figures suggest approximately 51% of mildly disabled young adults are without employment after receiving intensive special educational services as students. The majority of these adults are poor readers (Behrmann, 1992).

Clearly there is encouragement for educators to explore new methods and materials that increase student performance while stressing high order thinking (Hofmeister, 1992). Chapter 1 and IDEA can play an important role in the pursuit of two of our national education goals: to make sure that by year 2000 (1) the high school graduation rate will increase to 90%, and (2) every adult American will be literate and will

possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship (Bush, 1991).

Use of closed-captioned educational video can be a promising technological method to accomplish Education 2000 goals. Recent results of a study using closed-captioned video with college level students having reading deficits suggest closed-captioned video may be an effective method. Preliminary results suggest students without reading deficits learn and retain information more efficiently after viewing closed-captioned educational video than without closed-captioning; however, this proved to be the least effective for those students with reading deficits (Meyer & Lee, 1992). These effects may be the result of the prompt rate, which is matched with the speed of the narration. Poor readers may not be able to keep up with the rate; therefore, the captioning may be frustrating and distracting to the reading-deficient student. Therefore, there is a need to examine the effect of the prompt rate of closed-captioned educational video to better understand how it affects the reading comprehension of Chapter 1 and learning disabled students.

As reported in the National Captioning Institute Newsletter (August, 1990), former First Lady Barbara Bush, who made literacy one of her personal projects, voiced support for using captioning as an educational tool. Following a demonstration of closed-captioned technology at a White House meeting, Mrs. Bush commented, "It is so exciting to learn about research that indicates captioned television can help adults and children improve their reading skills, both at home and in a classroom." Mrs. Bush was commenting how closed-captioned video helps Asians and Hispanic-Americans learn English. This research explores whether these same kinds of gains can be made with persons who have significant reading deficits, but have English as their native language. If they respond to this technological tool, there is great potential to use closed-captioned video throughout American school systems, from elementary school through adult education.

Much of the current research with closed-captioned video has been done with Hearing Impaired (HI) populations (Montandon, 1982; Sherman & Sherman, 1989) and with persons who use English as a Second Language (ESL) (Markham, 1989; Spanos & Smith, 1990). Results are encouraging that closed-captioning is effective in enhancing learning. At this time, however, little has been done investigating whether reading deficient students being served in compensatory reading programs can learn more efficiently using closed-captioned video media with prompt rates correlated to their comprehension reading rates.

This study investigates whether reading deficient Chapter 1 and mildly disabled students (i.e., those with learning disabilities and/or behavioral disorders) learn and retain information more efficiently using closed-captioned video with appropriate paced prompt rates. Positive results using captioning technology should spark a new "industry" in the tailoring of closed-captioned videotaped educational media for learners of all abilities, including those with various reading deficits.

The first direct result of this research should affect methods and materials in the nation's Chapter 1 programs and those designed for mildly disabled reading students, including those served in inclusion models. Positive results from this study will support future directions to ensure accountability for optimal learning for Chapter 1 and learning disabled reading students. Development and use of more appropriate closed-captioned video across disciplines will better ensure success for all students and enhance the probability of improved high school retention/graduation rates as well as increased literacy skills in America.

Method

The purpose of this study is to examine closed-captioned prompt rates and their effect on learning for elementary students who underachieve in reading.

Subjects

Seventy-eight. fourth, fifth, and sixth grade students in Chapter 1 reading and sixty-two students with learning disabilities (52 students) and/or behavioral disorders (10 students) participated in this study. All students met state requirements for services in reading. Criteria for selected students were program placement, reading composite scores from the Iowa Test of Basic Skills (ITBS), and Reading Rate and Accuracy Level tests (Carver, 1987a, 1987b, 1992a, 1992b). The ITBS reading composite grade equivalency mean score was 3.64 (SD 1.03). Carver Reading Rate words per minute mean score for selected students was 116.49 (SD 25.36). Accuracy Level mean score for selected students was 21.68 (SD 6.02), with a mean grade equivalency of 3.23 (SD .97).

Table 1: Demographic Composition

Group	Age in Months		Gender		Race		
	Mean	Std. D.	Male	Female	White	Black	Other
MD	135.89	(16.13)	42	20	49	12	1
CH-1	135.32	(12.29)	31	47	33	45	0
Total	135.57	(14.07)	73	67	82	57	1

Materials

A 10 minute edited educational video, "The Truth About Turtles (Stouffer, 1990)" was used as treatment material. The script was modified to match the editing. The video's narration was replaced with background music; therefore, students had to read the captioned text with no auditory narration. The script was captioned and matched to the visual image. Two treatment videos were produced: Average-Paced Prompt Rate and Slow-Paced Prompt Rate.

Measures

A 13-item multiple choice test was constructed to measure students' knowledge of the topic and the content of the video. The items were constructed to test subjects' ability in decoding single words, understanding vocabulary, interpretation of sentences (including appreciation of morphology and syntax), identifying main ideas, identifying supporting details, rejecting irrelevant or distracting information, retelling a passage, identifying the author's intention and/or point of view, and summarizing. These are considered relevant parameters of reading comprehension necessary for reading success (Levine, 1987). This paper and pencil pretest was read to the students in small groups. Any student who scored 70% or better was to be eliminated from the study. No student scored that high. This test served as the pretest, posttest, and retention test measure.

Design

The experimental design is a 2x3x3 (Group x Treatment x Test Scores) within factor design. The two groups of students are Chapter 1 reading students and mildly disabled students with reading deficits. The three measures are pretest, posttest and retention test. The three treatments and their descriptions are:

A Average-Paced Closed-Captioned Video.
Students receiving this treatment viewed a closed-captioned video with prompt rate set at the mean reading rate of 116 words per minute.

S Slow-Paced Close-Captioned Video.
Students receiving this treatment viewed a closed-captioned video with prompt rate set at the mean reading rate of 78 words per minute.

P Printed Media.
Students receiving this treatment read a printed text in the amount of time allowed for the closed-captioned video. (This treatment served as control.)

Based on the grouping and treatment assignment described above, a grouping chart is depicted as follows:

Table 2: Design Chart and Cell Size

		Caption Prompt Rate		Printed
		Average-Paced	Slow-Paced	
Group	MD	21	19	22
	CH-1	26	20	32

Experimental Questions

1. Between groups, do Chapter 1 reading students perform differently from mildly disabled reading students in terms of their Carver reading comprehension rate and accuracy scores.
2. Between groups, do Chapter 1 reading students perform differently from mildly disabled reading students in terms of their mean pretest, posttest and retention test scores?
3. Between groups, do Chapter 1 reading students and mildly disabled reading students receiving the same treatment perform differently in their mean posttest and retention test scores?
4. Within groups, are there differences among treatments in mean posttest and retention test scores?
5. Are there differences between the experimental treatment (captioned video) and control (print) in mean posttest and retention test scores?
6. Are there differences between Average-Paced and Slow-Paced Prompt Rate treatments in mean posttest and retention test scores?

Apparatus

Production equipment used for this study were: 2 NEC PC-VCRs, a Softtouch closed-captioned encoding interface card, a DE132 decoder card, a Timebased video signal corrector, and a captioning software package, CPC 7000, installed on an IBM compatible personal computer to serve as a closed-captioned encoding station. Equipment used for data collection were 3 AV carts each housing a TeleCaption 4000 closed-captioned decoder, a Sharp 25" color video monitors, and an RCA 4-head video cassette player.

Procedures

Reading rate and accuracy reading level for nondisabled fourth, fifth, and sixth graders were 147 words per minute, or 4.4 grade level equivalency (Carver, 1987a, 1987b, 1992a, 1992b). These reading scores were established through standardized tests using only printed materials. This study used materials demanding attention to audio and visual movement as well as printed text (i.e., captioning). Other captioned videos designated for use in elementary classrooms were viewed and measured. Rates ranged from approximately 110 to 130 words per minute. Therefore, the captioned prompt rate was set at 116 words per minute as suggested by the Carver data. During the Pilot Study, a questionnaire was given the students asking for their responses concerning their comfort level with the prompt rate. Students indicated it was too fast. Therefore, we decided to use the prompt rate of 116 words per minute as the Average-Paced Prompt Rate that would be appropriate for nondisabled readers. (This rate also corresponded with other commercially produced captioned videos designed for elementary classrooms.)

The Slow-Paced Prompt Rate was determined by finding the lowest Accuracy Level Score and Reading Rate Score from the subject pool. According to Carver's Rauding Rate Score table, the appropriate words per minute level would be approximately 2 grade levels below the 116 words per minute average. This suggested a Slow-Paced Prompt Rate of 78 words per minute.

Pilot Study: Eighteen students drawn from the subject pool (i.e., 9 Chapter 1; 9 mildly disabled reading) were used in a Pilot Study. The Pilot Study consisted of 3 students per cell for both groups. Results from this Pilot Study were used to adjust the experimental process.

Experimental Study: One-hundred and forty students who scored below 70% correct in the pretest were randomly assigned to one of the three treatments. One week after the students completed the pretest and met the requirements, they were randomly assigned to one of the three treatments. Data of posttest scores were collected immediately after treatment; retention test scores were collected two weeks after treatment. Test items were read to the students for all measures.

Results

The dependent variables for the study were mean pretest, posttest, and retention test scores. Test items of the pretest, posttest and retention test were constructed in a multiple choice format.

Based on the experimental questions, all data were analyzed using the following statistical analysis procedures with a significance level set at $a = .05$. Trends are also reported with a significance level of $< .10$. Statistical analyses of all data in this investigation were performed through the use of SAS statistical software.

Analysis of Variance (ANOVA) procedures were conducted for all measures. When a significant difference was found in pretest scores, difference scores rather than mean scores were used for posttest and retention test analysis.

Mean scores of students' performances on pretest, posttest, and retention test are listed in Table 3. Difference scores are included in text.

Table 3: Mean Scores of Three Measures

Group		Pretest	Posttest	Retention
Sample (N = 140)	Mean	3.69	6.30	5.34
	Std. Dev.	(1.69)	(2.40)	(2.20)
MD (n = 62)	Mean	4.02	6.75	5.79
	Std. Dev.	(1.84)	(2.62)	(2.47)
CH-1 (n = 78)	Mean	3.43	5.95	4.97
	Std. Dev.	(1.52)	(2.16)	(1.89)
Average-Paced (n=47)	Mean	3.69	6.74	5.74
	Std. Dev.	(1.81)	(2.21)	(1.89)
Slow-Paced (n = 39)	Mean	4.37	7.62	6.54
	Std. Dev.	(1.73)	(2.10)	(1.82)
Control-Print (n=54)	Mean	3.04	4.98	4.13
	Std. Dev.	(1.30)	(2.11)	(2.12)
MD/Average (n = 21)	Mean	4.33	7.05*	6.05
	Std. Dev.	(1.83)	(2.63)	(1.91)
MD/Slow (n = 19)	Mean	4.74	8.05	7.05
	Std. Dev.	(1.97)	(2.37)	(2.17)
MD/Print (n = 22)	Mean	3.09	5.36	4.45
	Std. Dev.	(1.38)	(2.22)	(2.61)
CH-1/Average (n=26)	Mean	3.54	6.50	5.48*
	Std. Dev.	(1.75)	(1.84)	(1.87)
CH-1/Slow (n = 20)	Mean	4.00*	7.20	6.05
	Std. Dev.	(1.41)	(1.77)	(1.28)
CH-1/Print (n = 32)	Mean	3.00	4.72	3.91
	Std. Dev.	(1.27)	(2.04)	(1.71)

* denotes one missing data.

Between Group Effects

Question #1: A multivariate analysis was performed. No group differences were found for the Carver reading rate and accuracy measures. Both Chapter 1 and mildly disabled students were equivalent in their reading skills.

Question #2: Analysis for group differences produced a significant effect on pretest test scores $F(1,138) = 4.25$, $p = .0410$. The mildly disabled students ($M = 4.02$, $SD = 1.84$) outperformed their Chapter 1 peers ($M = 3.43$, $SD = 1.52$) in their previously acquired knowledge about turtles.

No group differences were found for posttest and retention test measures. Chapter 1 and mildly disabled students performed equally for all treatments.

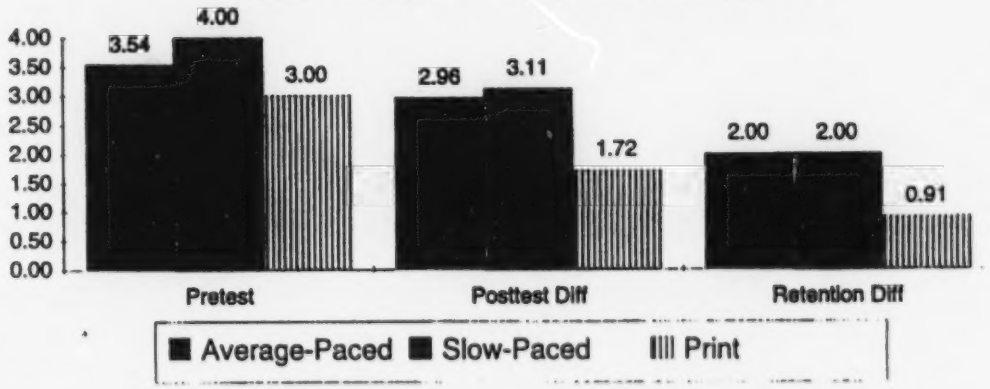
Question #3: No group differences were found in posttest and retention test for all treatments. Both groups learned similar amounts of information.

Within Group Effects

Question #4: For mildly disabled students, the pretest measure was significant $F(2, 61) = 5.16$, $p = .0086$. Mildly disabled students assigned to both Prompt Rates (Average-Paced Prompt Rate $M = 4.33$, $SD = 1.83$; Slow-Paced Prompt Rate $M = 4.74$, $SD = 1.97$) had more previous knowledge about turtles than their peers ($M = 3.09$, $SD = 1.38$) in print media. No difference was found for both posttest and retention test measures.

For Chapter 1 students, a trend was found $F(2, 77) = 2.82$, $p = .0658$ for pretest. Chapter 1 students assigned to both Prompt Rates (Average-Paced Prompt Rate $M = 3.54$, $SD = 1.75$; Slow-Paced Prompt Rate $M = 4.00$, $SD = 1.41$) tended to know more information about turtles before treatment than their same-group peers in the control group ($M = 3.0$, $SD = 1.27$) using print media. A significant difference was found for posttest $F(2, 76) = 4.09$, $p = .0206$. Chapter 1 students assigned to the captioned video treatments (Average-Paced Prompt Rate Difference $M = 2.96$, $SD = 1.82$; Slow-Paced Prompt Rate Difference $M = 3.11$, $SD = 1.41$) scored higher than their within-group peers (Difference $M = 1.72$, $SD = 2.34$) who received print media. A significant difference was found for retention test $F(2, 75) = 3.28$, $p = .0433$. Chapter 1 students assigned to the captioned video treatments (Average-Paced Prompt Rate Difference $M = 2.00$, $SD = 1.78$; Slow-Paced Prompt Rate Difference $M = 2.00$, $SD = 1.63$) scored higher than their peers (Difference $M = .91$, $SD = 1.99$) who received print media.

Figure 1: Chapter 1 Within-Group Differences

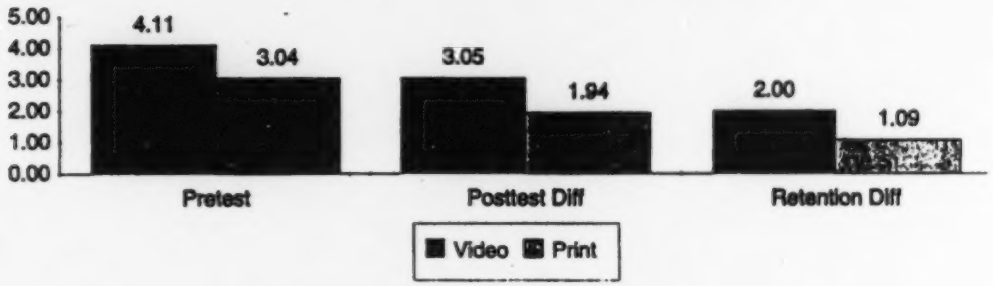


Treatment Effects

Question #5: For Experimental students, a significant difference was found $F(1, 138) = 14.52$, $p = .0002$ for pretest. Experimental students assigned to both Prompt Rates (Combined Prompt Rate $M = 4.11$, $SD = 1.78$) knew more information about turtles before treatment than their peers in the control group ($M = 3.04$, $SD = 1.30$) using print media. Treatment differences were found in both posttest and retention test scores. There was a significant difference in posttest scores $F(1,137) = 8.79$, $p = .0036$. Students assigned to the captioned video treatments (Difference Prompt Rate $M = 3.05$, $SD = 2.05$) learned more information than students assigned to print media. (Difference $M = 1.94$, $SD = 2.26$). There was a significant difference in retention test scores $F(1,137) = 6.54$, $p = .0116$. Students assigned to the captioned

video treatments (Difference Prompt Rate M = 2.00, SD = 1.84) retained more information than students assigned to print media. (Difference M = 1.09, SD = 2.30). Figure 2 illustrates differences between combined treatments and control

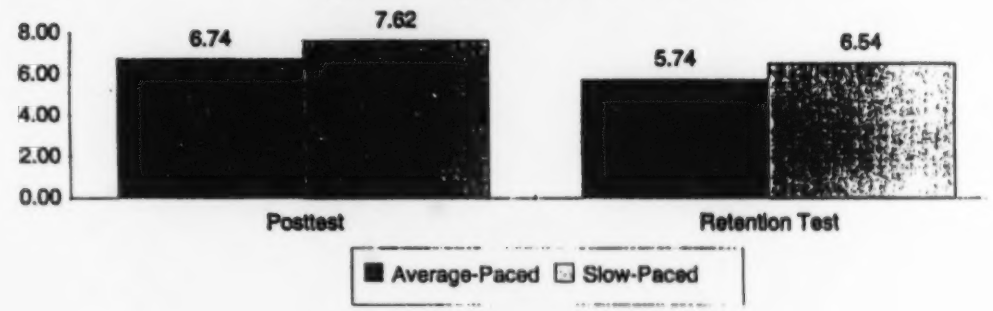
Figure 2: Experimental vs. Control—Difference Means



Question #6: No difference in experimental groups was found in pretest. Therefore, an ANOVA was used for analyses of mean scores.

A trend was found in posttest F(1, 84) = 3.48, p = .0655. Students assigned to the Slow-Paced Prompt Rate treatment (M = 7.62, SD = 2.10) tended to do better than those assigned to the Average-Paced Prompt Rate treatment (M = 6.74, SD = 2.21). There was a significant difference in retention test scores F(1, 84) = 3.91, p = .0514. Students assigned to the Slow-Paced Prompt Rate treatments (M = 6.54, SD = 1.82) retained more information than students assigned to the Average-Paced Prompt Rate treatment (M = 5.74, SD = 1.89). Figure 3 illustrates differences between the two experimental treatments.

Figure 3: Caption Treatment Effects



Discussion

Provision for making the closed-caption decoding techniques widely available was through legislative mandate, with the target users being those with hearing impairment. On October 16, 1990, former President Bush signed the *Decoder Circuitry Act* into law. This act became effective in 1993 and requires all new television sets 13" or larger sold in the United States to have built in decoder circuitry. As schools purchase new and replacement equipment, soon all televisions will be capable of decoding closed-captioned video. Additionally, commercial producers of video commonly used in classrooms for educational

purposes are in the process of captioning all their new offerings and file videotapes. Many offer to exchange any videotapes owned by schools without captioning for ones with captioning.

Inclusive educational environments are the norm in most states. This model includes children with disabilities in the regular classroom with their peers. Special services are delivered by the teacher and support personnel in the regular classroom. Therefore, there will be children with a wide range of abilities in each classroom. Curriculum materials must be flexible in order to maximize learning for these differences.

Results from this study support that reading problems of children with mild disabilities, the majority being learning disabled, and those in Chapter 1, are similar. Their reading rates and accuracy reading levels are equivalent. However, children who are classified as mildly disabled (i.e., learning disabled and/or behavior disordered) under the rules and regulations of IDEA receive much more intensive remediation and one-to-one attention for their deficits than children in Chapter 1 classes. This could account for students with mild disabilities knowing more information about turtles than their Chapter 1 peers before treatment. Mildly disabled children are provided with more educational experiences delivered through hands-on materials and manipulatives. After both groups received the information about turtles, the differences disappeared. Chapter 1 students learned and retained more information about turtles than their mildly disabled peers. They caught up.

Chapter 1 students improved their knowledge base about turtles significantly more than mildly disabled students after seeing the captioned video treatments. They might have found the captioned video more novel and, therefore, paid more attention to the video content. The more traditional print materials were not as stimulating and produced significantly less learning and retention of information. It is interesting to note that the mildly disabled students did not show a significant difference in their learning when using print materials. The emphasis on learning strategies in their educational programs may have caused this, although their scores for captioned treatments were higher, but not significantly so.

There is controversy among teachers whether children are saturated with videos in the classroom to the point they no longer pay attention to content. Results support this is not the case. When students experienced a moving visual, music, and print at the bottom of the screen, they attended to the information presented. All children with reading deficits learned and retained more though captioned video, even when there was no narration to give them additional clues to its content.

The critical question in the study was the examination of the power of the prompt rate. Did its speed make a difference for children who struggle in reading? A strong trend indicated that the Slow-Paced Prompt Rate was better for these children when assessing learning immediately after treatment, but would this learned information still be there two weeks later? The retention test is the more powerful measure of learning and what teachers strive for with their students. Yes. Slow-Paced Prompt Rate was significantly better than the faster Average-Pace Prompt Rate. Students with reading deficits responded positively when they had more time to process the captioning vocabulary.

Results of this study are important for teachers, parents, and commercial producers of videotapes. Children will learn and retain more from captioned educational videotapes rather than traditional print materials containing the same information (e.g., books, workbooks, ditto pages, etc.). Additionally, educators should address reading deficits in Chapter 1 and mildly disabled special education students similarly. Chapter 1 students appear to respond strongly to novel curriculum approaches which supports Drum and Calfee's (1979) assertion these students have been given much more of the "same old stuff." When teachers have the option of using a television with a captioning decoder chip along with a closed-captioned video, they should use it in their classrooms for all subjects.

Parents search for ways to help their children improve their reading skills. Using the captioning option on their home television for closed-captioned programs is an easy, inexpensive way to help their children. Each month more programs are closed-captioned and are designated by a closed-captioned symbol in television guides. A growing body of research suggests captioning, intended for hearing impaired populations, is highly effective for learning language and improving literacy skills.

Companies which are in the process of captioning their educational videotapes should take into consideration the many viable uses of captioning in education. Prompt rates should be designed so that children with various reading speeds and comprehension skills have enough time to read and process the information. Until technology is developed that allows users to adjust prompt rates to their own reading rate level, captioned video materials must take into consideration a variety of reading competencies.

References

Behrmann, J. (1992, Spring). Study reveals how disabled fare in years after school. Indiana Counterpoint, pp. 1, 17-18.

Bush, G. (1991). America 2000: An education strategy. Washington, DC: U.S. Department of Education.

Carver, R. P. (1987a). Technical manual for the Accuracy Level Test. Kansas City, MO: Revrac Publications.

Carver, R. P. (1987b). Technical manual for the Rate Level Test. Kansas City, MO: Revrac Publications.

Carver, R. P. (1992a). Reading rate: Theory, research, and practical implications. Journal of Reading, 36, 84-95.

Carver, R. P. (1992b). What do standardized tests of reading comprehension measure in terms of efficiency, accuracy, and rate? Reading Research Quarterly, 27, 347-359.

Drum, P. A., & Calfee, R. C. (1979). Compensatory reading programs, what are they like, and are they different? In R. C. Calfee, & P. A. Drum (Eds.). Teaching reading in compensatory classes (pp 172-191). Newark, DE: International Reading Association.

Fagan, T. W., & Heid, C. A. (1991). Chapter 1 program improvement: Opportunity and practice, Phi delta kappan, 72, 582-585.

Hofmeister, A. M. (1992). Learner diversity and instructional video: Implications for developers. Educational Technology, 32, 13-16.

Johnson, D. (1987). Specific developmental disabilities of reading, writing and mathematics (pp. 138-157). In Interagency Committee on Learning Disabilities, Learning disabilities: A report to the U.S. Congress. Washington, DC: Government Printing Office.

Karlsen, B., Madden, R., & Gardner, E. F. (1984). Stanford Diagnostic Reading Test. New York, NY: Harcourt Brace Jovanovich.

LeTendre, M. J. (1991). Improving chapter 1 programs: We can do better. Phi delta kappan, 72, 576-580.

Levine, M. D. (1987). Developmental variation and learning disorders. Cambridge, MA: Educational Publishing Service, Inc. (P. 298).

Markham, P. L. (1989). The effects of captioned television videotapes on the listening comprehension of beginning, intermediate, and advanced ESL students. Educational Technology, 29, 38-41.

Meyer, M. J., Day, S. L., & Lee, Y. B. (1992). Symmetry in building block design for learning disabled and nonlearning disabled boys. Perceptual and motor skills, 74, 1031-1039.

Meyer, M. J., & Lee, Y. B. (1992). [Effects of captioned educational video for college students having deficient english/reading skills]. Unpublished raw data.

Montandon, B. (1982). Multi-level captioning: Alternatives that match the viewers' abilities. Perspectives for Teachers of the Hearing Impaired. 1, 8-12.

Sherman, R. Z., & Sherman, J. D. (1989). Analysis of demand for decoders of television captioning for deaf and hearing-impaired children and adults. (ED314892). Pelavin Associates, Inc., Washington, DC.

Spanos, G., & Smith, J. J. (1990). Closed captioned television for adult LEP literacy learners. (ED321623). Adjunct ERIC Clearinghouse on Literacy Education for Limited-English-Proficient Adults, Washington, DC.

Staff. (1990, August 27). Captioned TV benefits hearing audiences. NCI News, p. 4.

Stouffer, M (1990) The truth about turtles. Marty Stouffer Productions. Aspen, CO.

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